minutes; extreme velocities are gusts of shorter duration, and are not given in this table):

Stations.	Date.	Velocity.	Direction.	Stations.	Date.	Velocity.	Direction.
		Miles				*Miles*	
Amarillo, Tex	21	52	w.	Fort Canby, Wash.	7	52	se.
Atlantic City, N. J.	2	52	ne.	Havre, Mont.	16	54	sw.
Block Island, R. I.	2	57	e.	Huron, S. Dak	19	50	se.
Do	3	70	ne.	Jupiter, Fla	5	51	se.
Do	12	60	ne.	Kittyhawk, N. C.	3	60	n.
Buffalo, N. Y.	14	50	sw.	New Haven, Conn.	6	56	e.
Do	23	50	w.	New York, N. Y.	6	60	e.
Do	27	54	w.	San Antonio, Tex	23	60	n.
Charleston, S. C	6	56	se.	Tatoosh Island, Wash.	11	54	nw.
Chicago, Ill	21	51	e.	Do	15	60	w.
Cleveland, Ohio	23	57	w.	Williston, N. Dak	16	60	nw.
El Paso, Tex	6	57	sw.	Winnemucca, Nev.	5	50	sw.
Do	19	56	sw.				

SUNSHINE AND CLOUDINESS.

The quantity of sunshine, and therefore of heat, received by the atmosphere as a whole is very nearly constant from year to year, but the proportion received by the surface of the earth depends upon the absorption by the atmosphere, and varies largely with the distribution of cloudiness. The sunshine is now recorded automatically at 22 regular stations of the Weather Bureau by its photographic, and at 36 by its thermal effects. At one of these stations records are kept by both methods. The photographic record sheets show the apparent solar time, but the thermometric records show seventy-fifth meridian time; for convenience the results are all given in Table X for each hour of local mean time. In order to complete the record of the duration of cloudiness these registers are supplemented by special personal observations of the state of the sky near the sun in the hours after sunrise and before sunset, and the cloudiness for these hours has been added as a correction to the instrumental records, whence there results a complete record of the duration of sunshine from sunrise to sunset.

The average cloudiness of the whole sky is determined by numerous personal observations at all stations during the daytime, and is given in the column "average cloudiness" in Table I; its complement, or percentage of clear sky, is given in the last column of Table X.

Difference between instrumental and personal observations of sunshine.

Stations.	Apparatus.	Total possible duration for the whole month.	Personal estimated area of clear sky.	Instrumental record of sunshine.			
				Photographic.	Difference.	Thermometric.	Difference.
		H'rs.	%	%	%	%	%
Tampa, Fla	T.	314.1	58	.....	.....	63	+ 5
Galveston, Tex	P.	313.1	45	50	+ 5	.....	.....
New Orleans, La	T.	312.1	24	.....	.....	24	0
Savannah, Ga	P.	309.8	35	34	− 1	.....	.....
Vicksburg, Miss	T.	309.8	52	.....	.....	54	+ 2
Charleston, S. C	T.	308.3	43	.....	.....	43	0
Phœnix, Ariz	P.	308.3	63	70	+ 7	.....	.....
San Diego, Cal	P.	308.3	54	67	+13	.....	.....
Atlanta, Ga	T.	307.1	38	.....	.....	36	− 2
Los Angeles, Cal	P.	307.1	58	65	+ 7	.....	.....
Wilmington, N. C	T.	307.1	46	.....	.....	50	+ 4
Chattanooga, Tenn	T.	305.8	35	.....	.....	31	− 4
Little Rock, Ark	T.	305.8	33	.....	.....	49	+16
Nashville, Tenn	T.	305.0	40	.....	.....	46	+ 6
Raleigh, N. C	T.	305.0	40	.....	.....	53	+13
Santa Fe, N. Mex	P.	305.0	46	60	+14	.....	.....
Fresno, Cal	T.	303.3	50	.....	.....	58	+ 8
Dodge City, Kans	P.	302.3	54	58	+ 4	.....	.....
Louisville, Ky	T.	302.3	28	.....	.....	38	+10
San Francisco, Cal	T.	302.3	43	.....	.....	51	+ 8
Atlantic City, N. J	P.	300.8	38	45	+ 7	.....	.....
Baltimore, Md	T.	300.8	33	.....	.....	40	+ 7
Cincinnati, Ohio	T.	300.8	34	.....	.....	36	+ 2
Kansas City, Mo	P.	300.8	30	34	+ 4	.....	.....
St. Louis, Mo	T.	300.8	30	.....	.....	48	+18

Difference between instrumental and personal observations.—Cont'd.

Stations.	Apparatus.	Total possible duration for the whole month.	Personal estimated area of clear sky.	Instrumental record of sunshine.			
				Photographic.	Difference.	Thermometric.	Difference.
		H'rs.	%	%	%	%	%
Washington, D. C	P.	300.8	39	44	+ 5	.....	.....
Columbus, Ohio	T.	299.7	22	.....	.....	31	+ 9
Denver, Colo	P.	299.7	50	59	+ 9	.....	.....
Indianapolis, Ind	T.	299.7	36	.....	.....	52	+16
Philadelphia, Pa	T.	299.7	36	.....	.....	58	+22
Cheyenne, Wyo	P.	298.4	42	55	+13	.....	.....
Eureka, Cal	P.	298.4	34	35	+ 1	.....	.....
New York, N. Y.	T.	298.4	36	.....	.....	55	+19
Omaha, Nebr	P.	298.4	34	45	+11	.....	.....
Pittsburg, Pa	T.	298.4	24	.....	.....	28	+ 4
Salt Lake City, Utah	P.	298.4	17	32	+15	.....	.....
Binghamton, N. Y	T.	296.5	30	.....	.....	35	+ 5
Boston, Mass	T.	296.5	49	.....	.....	54	+ 5
Chicago, Ill	T.	296.5	29	.....	.....	31	+ 2
Cleveland, Ohio	T.	296.5	18	.....	.....	20	+ 2
Des Moines, Iowa	T.	296.5	35	.....	.....	38	+ 3
Detroit, Mich	T.	296.5	24	.....	.....	34	+10
Dubuque, Iowa	T.	296.5	36	.....	.....	29	− 7
Albany, N. Y.*	T.	295.4	36	.....	.....	59	+23
Buffalo, N. Y	T.	295.4	23	.....	.....	34	+11
Idaho Falls	T.	295.4	17	.....	.....	43	+26
Rochester, N. Y	T.	295.4	25	.....	.....	28	+ 3
Northfield, Vt	P.	293.8	34	47	+13	.....	.....
Portland, Me	T.	293.8	50	.....	.....	66	+16
Eastport, Me	P.	291.9	50	58	+ 8	.....	.....
Minneapolis, Minn†	T.	291.9	.....	.....	.....	28	.....
St. Paul, Minn.	P.	291.9	25	25	0	.....	.....
Portland, Oreg	T.	290.4	29	.....	.....	25	− 4
	P.	290.4	29	.....	.....	21	− 8
Bismarck, N. Dak	P.	288.7	43	53	+10	.....	.....
Helena, Mont	P.	288.7	39	41	+ 2	.....	.....
Seattle, Wash	T.	286.8	28	.....	.....	32	+ 4
Spokane, Wash	P.	286.8	26	29	+ 3	.....	.....

COMPARISON OF DURATIONS AND AREAS.

The sunshine registers give the *durations* of effective sunshine whence the durations relative to possible sunshine are derived; the observers' personal estimates give the percentage of *area* of clear sky. These numbers have no necessary relation to each other, since stationary banks of clouds may obscure the sun without covering the sky, but when all clouds have a steady motion past the sun and are uniformly scattered over the sky, the percentages of duration and of area agree closely. For the sake of comparison, these percentages have been brought together, side by side, in the following table, from which it appears that, in general, the instrumental records of percentages of durations of sunshine are almost always larger than the observers' personal estimates of percentages of area of clear sky; the average excess for February, 1897, is 7 per cent for photographic and 7 per cent for thermometric records.

The details are shown in the preceding table, in which the stations are arranged according to the *total possible* duration of sunshine, and not according to the *observed* duration.

ATMOSPHERIC ELECTRICITY.

Numerical statistics relative to auroras and thunderstorms are given in Table IX, which shows the number of stations from which meteorological reports were received, and the number of such stations reporting thunderstorms (T) and auroras (A) in each State and on each day of the month, respectively.

Thunderstorms.—The dates on which reports of thunderstorms for the whole country were most numerous were: 20th, 201; 21st, 176; 22d, 187.

Thunderstorm reports were most numerous in: Illinois, 74; Kentucky, 77; Louisiana, 62; Missouri, 70; Tennessee, 63; Virginia, 68.

Thunderstorms were most frequent in: Florida and Georgia, 12 days; Louisiana, 14; Tennessee and Virginia, 10.

Auroras.—The evenings on which bright moonlight must